

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 61.S3502WO18		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/B2004/003186		International filing date (day/month/year) 28.09.2004		Priority date (day/month/year) 30.09.2003
International Patent Classification (IPC) or national classification and IPC H02K5/10, F16J15/06				
Applicant SPAL AUTOMOTIVE S.r.l. et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 29.07.2005		Date of completion of this report 05.09.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Flyng, G Telephone No. +49 89 2399-2697		



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/B2004/003186

Box No.	Basis of the report
1	1. Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-6 as originally filed

Claims, Numbers

1-8 received on 01.08.2005 with letter of 29.07.2005

Drawings, Sheets

1/1 as originally filed

- ☐
- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
 - ☒ claims Nos. 8
- because:
- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
 - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
 - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
 - ☒ no international search report has been established for the said claims Nos. 8
 - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
 - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
 - ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IB2004/003186

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-7
	No: Claims	
Inventive step (IS)	Yes: Claims	1-7
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item III.

See Rule 6.2A PCT

Re Item V.

- 1 The documents cited in the search report will be referred to using the following reference numbering:
D1: US 2003/098548 A1 (BOONE NICK et AL) 29 May 2003
D2: US-B-6 257 5921 (HASHIZAWA SHIGEMI et AL) 10 July 2001
D3: DE 42 35 437 C (GLÖCKLER-DICHTUNGEN GUNTER HEMMRICH GMBH) 2 September 1993
D4: EP-A-0 500 282 (ISHIKAWA GASKET) 26 August 1992
D5: EP-A-1 191 262 (DFT MASCHB GMBH) 27 March 2002
D6: EP-A-1 045 174 (BRIDGESTONE CORP) 18 October 2000
D7: US-A-6 150 744 (ONISHI YOSUKE) 21 November 2000
D8: US-A-5 767 596 (KECK ARTHUR C et AL) 16 June 1998
2. Document D1 is the closest prior art. It discloses a sealing ring suitable for use in sealing a casing of a motor (paragraph [0001]). It is implicit that such a motor would have a rotor and a stator. In the detailed embodiment of D1 the seal is used in a pump. The pump has a pump housing 26 (cup-shaped part) and a cover 50 connected by screws 48 - see figure 6 and paragraph [0022]. The seal 10 is an O-ring and is inserted into a groove 44 of the housing 26. The seal comprises ribs 18 which act as retaining means for better retention (paragraph [0006]). The ribs operate in conjunction with the inside face of the groove 44.
3. The subject-matter of claim 1 differs from the disclosure of D1 in that:
"the seal (7) retaining means (8) are rings (11) each of that connected to the seal (7) by two sections (12)" (emphasis added).

The expression "each of that" is grammatically incorrect in the context (Article 6 PCT). It is assumed that the applicant intended to specify that:

"the seal (7) retaining means (8) are rings (11) each ring (11) being

connected to the seal (7) by two sections (12)".

4. The problem solved by the characterising features may be considered to be to find an alternative way of retaining the O-ring seal. Faced with this problem the skilled person would consider the retaining means disclosed in document D2. In D2, a sealing ring 10 is provided with integral retaining rings 12 that are secured over pins 32 of the casing to keep the seal in place. From figure 1C it can be seen that the retaining rings 12 are thinner than the seal. However the fixing rings of D2 are connected to the sealing ring by a single connecting section (root section 14) and not by "two sections" as is specified in amended claim 1. Starting from D1 and seeking an alternative means to retain the seal in place, it would seem to be a routine matter to provide integral retaining rings as known from D2, but there is no hint in D1, D2 or any of the other available prior art documents to connect the retaining rings to the O-ring seal using "two sections". Thus, the subject-matter of claim 1 meets the requirements of Articles 33(2) and (3) PCT.
5. Claims 2 to 7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Outstanding matters to be attended to during the Regional Phase, at least before the European Patent Office

For reasons of clarity, Article 6 PCT, the following amendments will be necessary in the claims:

- Claim 1 line 6 - replace "presenting" with "being";
- Claim 1 lines 12 and 13 - replace "each of that" with "each ring (11) being";
- Claim 2 - replace "any of the foregoing claims" with "claim 1";
- Claim 7 - delete the feature "the rings (11) are connected to the seal (7) by sections (12) and", as this feature is already set out in claim 1;
- Claim 8 - delete the whole claim.

For consistency with the claims, the reference to a method claim on page 2 lines 30 to 32 will have to be deleted.

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the documents D1 and D2 are not identified in the description and the relevant background art they disclose is not acknowledged.

The vague and imprecise statements in the last two paragraphs of the description will have to be deleted because they imply that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.

In figure 1, at the top of the lid 6, the reference numeral indicating the fixing means should be changed from 8 to 9 to be consistent with the description page 3 line 32.

Claims

1. An electric motor (1) comprising a casing (2) in which there is a stator and a rotor (3) mounted on a shaft (4), the casing (2) comprising a cup-shaped part (5) and a lid (6) connected to one another with removable connecting devices, and a static seal (7) inserted between the cup-shaped part (5) and the lid (6), *the seal presenting an O-ring seal positioned in a seat (10) in the lid (6) or in the cup-shaped part (5), the electric motor being characterised in that the seal (7) comprises and also comprising* retaining means (8) so that it remains applied to one of the elements, either the lid (6) or the cup-shaped part (5); *the electric motor being characterised in that the seal (7) retaining means (8) are rings (11) each of that connected to the seal (7) by two sections (12).*

~~2. The electric motor (1) according to claim 1, characterised in that the seal (7) is an O-ring seal positioned in a seat (10) in the lid (6) or in the cup shaped part (5).~~

~~3. The electric motor (1) according to claim 1 or 2, characterised in that the seal (7) retaining means (8) are rings (11) connected to the seal (7) by sections (12).~~

4 2. The electric motor (1) according to any of the foregoing claims, characterised in that the seal (7) retaining means (8) operate in conjunction with fixing means (9) present in the lid (6) or in the cup-shaped part (5).

5 3. The electric motor (1) according to claim 2 4, characterised in that the fixing means (9) are pins (15) which have a diameter slightly larger than that of the ring (11) internal hole, so that the ring adheres to the pin (15) thanks to the elasticity of the material used to make the ring (11).6.

6 4. The electric motor (1) according to claim 2 4, characterised in that the fixing means (9) are pins (15) which

have a truncated cone profile or a circumferential cavity with a diameter slightly larger than that of the ring (11) internal hole, so that the ring adheres to the pin (15) thanks to the elasticity of the material used to make the ring (11).

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7 5. The electric motor (1) according to claim 2 4, characterised in that the rings (11) are close to the devices connecting the cup-shaped part (5) and the lid (6), the latter respectively having protrusions (13, 14) in which the connecting devices, the rings (11) and the pins (15) are located.

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8 6. The electric motor (1) according to any of the foregoing claims, characterised in that the rings (11) are integral with the seal (7) and are made of the same elastomeric material.

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9 7. The electric motor (1) according to any of the foregoing claims, characterised in that the rings (11) are connected to the seal (7) by sections (12) and the rings (11) and the sections (12) are made with a diameter (d) smaller than, or are thinner than, the diameter or the thickness (D) of the seal 7, so that they do not interfere with seal 7 compression.

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~~10. A method for assembly of the casing (2) of an electric motor (1), the casing (2) comprising a cup shaped part (5) and a lid (6), comprising the steps of inserting an O ring seal (7) in a seat (10) in the lid (6) or in the cup shaped part (5), the O ring seal (7) having retaining rings (11), inserting each retaining ring (11) on a respective fixing pin (15) present in the lid (6) or in the cup shaped part (5), so that the seal (7) remains positioned in the seat (10) applied to one of the elements, either the lid (6) or the cup shaped part (5), fitting the components (3) inside the casing (2), and connecting the lid (6) to the cup shaped part (5).~~

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11 8. The electric motor and method for assembly of the motor according to the foregoing claims, as described and illustrated with reference to the accompanying drawings and for the above-mentioned aims.